WHAT IS CLAIMED IS:

1. A substantially pure composition of mammalian common lymphoid progenitor cells, wherein at least 95% of the cells in said composition are characterized as *c-kit*^{lo}, IL-7Rα^+, lin$^-$; and wherein said progenitor cells are capable of giving rise to T cells, B cells and natural killer cells.

2. A composition of mammalian common lymphoid progenitor cells according to Claim 1, wherein said cells are blast cells.

3. A composition of mammalian common lymphoid progenitor cells according to Claim 1, wherein said cells are further characterized as Thy-1$^-$.

4. A composition of mammalian common lymphoid progenitor cells according to Claim 1, wherein said cells are mouse cells, and are further characterized as Sca-1^{lo}.

5. A composition of mammalian common lymphoid progenitor cells according to Claim 1, wherein said cells are further characterized as CD43^{lo}, HSA^{lo}, CD45$^+$ and MEL-14$^-$.

6. A composition of mammalian common lymphoid progenitor cells according to Claim 1, wherein said cells are genetically modified to comprise an exogenous DNA vector.

7. A method of enrichment for a composition of mammalian common lymphoid progenitor cells, wherein at least 95% of the cells in said composition are characterized as *c-kit*^{lo}, IL-7Rα^+, lin$^-$; and wherein said progenitor cells are capable of giving rise to T cells, B cells and natural killer cells, the method comprising:

combining reagents that specifically recognize *c-kit,* IL-7Rα and lin markers with a sample of hematopoietic cells; and

selecting for those cells that are *c-kit*^{lo}, IL-7Rα^{+}, lin^{-}, to provide an enriched population of cells having lymphoid lineage progenitor activity.

8. A method according to Claim 7, wherein said sample of hematopoietic cells is bone marrow.

9. A method according to Claim 7, wherein said sample of hematopoietic cells is mobilized peripheral blood.

10. A method according to Claim 7, further comprising the step of selecting by size for blast cells.

11. A method according to Claim 7, wherein said cells are mouse cells, and further comprising the steps of:

combining reagents that specifically recognize Sca-1 with said sample of hematopoietic cells; and

selecting for those cells that are Sca-1^{lo}.

12. A method of genetically modifying mammalian common lymphoid progenitor cells, the method comprising:

combining reagents that specifically recognize *c-kit,* IL-7Rα and lin markers with a sample of hematopoietic cells; and

selecting for those cells that are *c-kit*^{lo}, IL-7Rα^{+}, lin^{-}, to provide an enriched population of cells having lymphoid lineage progenitor activity;

transducing said enriched population of cells with an exogenous DNA to provide a population of genetically modified mammalian common lymphoid progenitor cells.

13. A method according to Claim 12, wherein said sample of hematopoietic cells is bone marrow.

14. A method according to Claim 12, wherein said sample of hematopoietic cells is mobilized peripheral blood.

15. A method according to Claim 12, wherein said exogenous DNA is a retroviral-based vector comprising a mammalian gene.

16. A method of transplanting lymphoid lineage progenitor cell activity into a mammalian recipient, the method comprising:

transplanting a substantially pure composition of mammalian common lymphoid progenitor cells, wherein at least 95% of the cells in said composition are characterized as expressing *c-kit*^{lo}, IL-7Rα^{+}, lin^{-}, into said recipient;

wherein said mammalian common lymphoid progenitor cells give rise to T cells, B cells and natural killer cells.

17. A method of *in vitro* culture for hematopoietic cells, the method comprising:

introducing a population of cells according to Claim 1 into a culture medium comprising c-kit ligand; and

maintaining said culture *in vitro* for at least about 7 days.

18. A method according to Claim 17, wherein said culture medium further comprises methylcellulose and interleukin 7, and wherein said CLP differentiate into B lineage cells.